

CLAIMS

What is claimed is:

1. A two-speed gearbox assembly comprising:
 - a housing;
 - a case rotationally mounted within said housing;
 - a differential spider mounted to said case, said differential spider comprising a plurality of legs which mount a plurality of inner differential pinion gears and a plurality of outer pinion gears;
 - a first clutch mounted between said housing and said case to selectively lock an input side gear to said case to provide a first reduction ratio; and
 - a second clutch mounted to said housing to selectively lock an opposite side gear to said housing to provide a second reduction ratio.
2. The two-speed gearbox assembly as recited in claim 1, further comprising:
 - a differential spider mounted to said case, said differential spider comprising a plurality of legs which mount a plurality of inner differential pinion gears and a plurality of outer pinion gears;
 - a first axle shaft engaged with said inner differential pinion gears, said first axle shaft defined along an axis of rotation; and
 - a second axle shaft engaged with each of said differential pinion gears, said second axle shaft defined along said axis of rotation.
3. The two-speed gearbox assembly as recited in claim 2, further comprising:
 - a first differential axle side gear mounted to said first axle shaft;
 - a second differential axle side gear mounted to said second axle shaft;
 - a locking differential clutch mounted between said first and second differential axle side gears to selectively lock said first and second differential axle side gears together.

4. The two-speed gearbox assembly as recited in claim 3, further comprising:
a split differential spider comprising a plurality of legs in which pressurized fluid is communicated along the length of each of said plurality of legs.
5. The two-speed gearbox assembly as recited in claim 3, further comprising:
a split differential spider comprising a plurality of legs;
a plurality of sealed pistons located within said split differential spider such that in response to a pressurized fluid communicated along the length of each of said plurality of legs said plurality of sealed pistons actuate said locking differential clutch to selectively lock said first and second differential axle side gears together.
6. The two-speed gearbox assembly as recited in claim 1, wherein:
said input side gear coaxially mounted about said axis of rotation and engaged with
said outer pinion gears; and
said opposite side gear coaxially mounted about said axis of rotation and engaged
with said outer pinion gears.
7. The two-speed gearbox assembly as recited in claim 1, further comprising:
a biasing member which maintains said first clutch in an actuated condition.
8. The two-speed gearbox assembly as recited in claim 1, further comprising:
a biasing member which maintains said second clutch in an actuated condition.

9. A two-speed gearbox assembly comprising:

- a housing;
- a case rotationally mounted within said housing;
- a differential spider mounted to said case, said differential spider comprising a plurality of legs which mount a plurality of inner differential pinion gears and a plurality of outer pinion gears;
- a first axle shaft engaged with said inner differential pinion gears, said first axle shaft defined along an axis of rotation;
- a second axle shaft engaged with each of said differential pinion gears, said second axle shaft defined along said axis of rotation;
- an input side gear coaxially mounted about said axis of rotation and engaged with said outer pinion gears;
- an opposite side gear coaxially mounted about said axis of rotation and engaged with said outer pinion gears;
- a first clutch mounted between said housing and said case to selectively lock said input side gear to said case to provide a first reduction ratio; and
- a second clutch mounted to said housing to selectively lock said opposite side gear to said housing to provide a second reduction ratio.

10. The two-speed gearbox assembly as recited in claim 9, further comprising: a biasing member which maintains said first clutch in an actuated condition.

11. The two-speed gearbox assembly as recited in claim 9, further comprising: a biasing member which maintains said second clutch in an actuated condition.

12. The two-speed gearbox assembly as recited in claim 9, wherein said differential spider comprises a split differential spider comprising a plurality of legs in which pressurized fluid is communicated along the length of each of said plurality of legs.

13. The two-speed gearbox assembly as recited in claim 12, further comprising:
a first differential axle side gear mounted to said first axle shaft;
a second differential axle side gear mounted to said second axle shaft; and
a locking differential clutch mounted within said split differential clutch to selectively lock said first and second differential axle side gears together.
14. The two-speed gearbox assembly as recited in claim 12, wherein said differential spider comprises a split differential spider a split differential spider comprising a plurality of legs; and
a plurality of sealed pistons located within said split differential spider such that in response to a pressurized fluid communicated along the length of each of said plurality of legs, said plurality of sealed pistons actuate said locking differential clutch to selectively lock a first and a second differential axle side gears together to lock said first axle shaft to said second axle shaft.
15. The two-speed gearbox assembly as recited in claim 9, further comprising:
an electric motor which drives said input side gear.

16. A method of selecting between a first and a second reduction ratio comprising the steps of:

- (1) selectively actuating a first clutch mounted between a housing and a case rotationally mounted within the housing to selectively lock an input side gear to the case to provide a first reduction ratio; and
- (2) selectively actuating a second clutch mounted to the housing to selectively lock an opposite side gear to the housing to provide a second reduction ratio.

17. A method as recited in claim 16, wherein said step (1) further comprising the step of:

selectively actuating a locking differential clutch mounted within a split differential clutch to selectively lock a first and second differential axle side gear together to selectively lock a first and a second axle shaft.

18. A method as recited in claim 16, wherein said step (1) further comprising the step of:

biasing the first clutch to an actuated condition.

19. A method as recited in claim 16, wherein said step (1) further comprising the step of:

biasing the second clutch to an actuated condition